Joshua E. Goldford
Physics of Living Systems, Massachusetts Institute of Technology
400 Technology Square, Cambridge, MA 02139 ph: (314)-775-7071
goldford@mit.edu

EDUCATION

2020-Present	Physics of Living Systems Fellow	MIT
2013-2018	P.h.D, Bioinformatics (advisor Daniel Segrè)	Boston University
2011-2013	M.S., Microbial Engineering (advisor Igor Libourel)	University of Minnesota
2005-2010	B.S., Chemistry, Biochemistry with Honors, *Cum laude*	University of Minnesota

PUBLICATIONS & MANUSCRIPTS

Goldford, J.E.*, George, A.B., Flamholz A., & Segrè, D. Protein cost minimization promotes the emergence of coenzyme redundancy. *in review* (*corresponding author)

Diaz-Colunga, J., Lu, N., Sanchez-Gorostiaga, A., Chang, C.Y.,Cai, H.S., **Goldford, J.E.**, Tikhonov M., & Sanchez, A. Top-down and bottom-up cohesiveness in microbial community coalescence. *submitted*

Estrela, S.,Vila, J.C.C., Lu, N., Bajic, D., Rebolleda-Gomez, M., Chang, C.Y., **Goldford, J.E.**, Sanchez-Gorostiaga, A., & Sanchez, A. Functional attractors in microbial community assembly. *submitted*

Rosenberg, D.R., Haber, M., **Goldford, J.E.**, Lalzar, M., Aharonovich, D., Al-Ashhab, A., Lehahn, Y., Krom, M.D., Steindler L., & Sher, D.J. Particle-associated and free-living bacterial communities in an oligotrophic sea are affected by different environmental and anthropogenic factors. *Environmental Microbiology*. 2021 May 25. doi: 10.1111/1462-2920.15611.

Kalev, P. et al. MAT2A inhibition blocks the growth of MTAP-deleted cancer cells by reducing PRMT5-dependent mRNA splicing and inducing DNA damage. *Cancer Cell,* 2021 Feb; 39(2):209-224.e11. doi: 10.1016/j.ccell.2020.12.010

Jinich, A., Sanchez-Lengeling, B., Ren, H., **Goldford, J.E.**, Noor, E., Sanders, J., Segrè, D.& Aspuru-Guzik, A. A thermodynamic atlas of carbon redox chemical space. *PNAS*. 2020 Dec; 117 (52) 32910-32918

Lawson, K.A. et al. Functional genomic landscape of cancer-intrinsic immune evasion to cytotoxic T lymphocyte killing. *Nature*, 2020 Sep; 586(120-126)

Marsland R., Cui W., **Goldford, J.E.**, & Mehta, P. The Community Simulator: A Python package for microbial ecology. *PLoS ONE* 2020 Mar; 15(3): e0230430

Goldford, J.E.*, Hartman, H., Marsland R., & Segrè, D*. Environmental boundary conditions for the origin of life converge to an organo-sulfur metabolism. *Nature Ecology & Evolution*. 2019 Nov; (3)1715-1724 (*co-corresponding authors)

Marsland R., Cui W., **Goldford, J.E.**, Sanchez, A., Korolev, K., & Mehta, P. Available energy fluxes drive a phase transition in the diversity, stability, and functional structure of microbial communities. *PLoS Computational Biology*. 2019 February; 15(2): e1006793

Goldford, J.E., Lu, N., Bajic, D., Estrela, S., Tikhonov M., Gorostiaga, A., Segrè, D., Mehta, P., &

Sanchez, A. Emergent simplicity in microbial community assembly. *Science*. 2018 August; (361) 469-74

Goldford, J.E., & Segrè, D. Modern views of ancient metabolic networks. *Current Opinion in Systems Biology.* 2018 Apr; (8) 117-124

Reznik, E., Christodoulou, D., **Goldford, J.E.**, Briars, E., Sauer, U., Segrè, D., & Noor E. Genome-scale architecture of small molecule regulatory networks and the fundamental trade-off between regulation and enzymatic activity. *Cell Reports.* 2017 Sep 12; 20(11) 2666–2677

Goldford, J.E., Hartman, H., Smith, T.F., & Segrè, D. Remnants of an ancient metabolism without phosphate. *Cell*. 2017 Mar 9; 168(6): 1126-1134[1]

Goldford, J.E. and Libourel, I. Unsupervised Identification of Isotope Labeled Peptides. *Analytical Chemistry*. 2016 Jun 7;88(11) 6092-6099

Mandy, D., **Goldford, J.E.**, Yang, H., Allen, D., & Libourel, I. Metabolic flux analysis using 13C peptide label measurements. *Plant Journal*. 2014 Feb; 77(3): 476-86

Allen, D.K., **Goldford, J.E.**,Gierse, J.K., Mandy, D., Diepenbrock, C.,& Libourel, I .Quantification of Peptide m/z Distributions from (13)C-Labeled Cultures with High-Resolution Mass Spectrometry. *Analytical Chemistry*. 2014 Feb 4;86(3): 1894-901

PRESENTATIONS

2022	Gordon Research Conference, Origin of Life (*invited speaker*)	Galveston, TX
2021	Geobiology summer course (*invited talk*)	Mammoth Lakes, CA
2021	Geological and Planetary Sciences Seminar (*invited talk*)	Caltech
2021	Geobiology seminar series (*invited talk*)	Colorado University
2020	NASA Origin of Life, Thio-biosphere group (*invited talk*)	NASA
2018	Stochastic Modeling in Ecology and Evolutionary Biology (*talk*)	U. of Padova, Venice Italy
2017	NASA Origin of Life, Thio-biosphere group (*invited talk*)	NASA
2017	Lawrence Livermore National Lab Seminar (*invited talk*)	LLNL
2017	Earth and Planetary Science Seminar (*invited talk*)	U. of California, Berkeley
2017	Biodesign symposium (*short talk)*	Boston University
2017	Simons Foundation Theory and Biology Conference (*poster*)	Flatiron Institute
2016	Physics of Living Systems Seminar (invited talk)	MIT
2015	Astrobiology conference, AbSciCon (*talk*)	AGU, Chicago, IL
2014	Intelligent Systems for Molecular Biology (ISMB) (*poster*)	ISMB, Boston, MA

TEACHING

2017	Guest Lecturer for *Dynamics and Evolution of Biological Networks*	Boston University
2016	Teaching assistant for *Methods and Logic in Quantitative Biology*	Boston University
2009	Teaching assistant *Biochemistry*	University of Minnesota
2008	Teaching assistant *Biochemistry*	University of Minnesota

PROFESSIONAL POSITIONS

2018-2020	Computational Biologist, Cell Metabolism	Agios Pharmaceuticals, Cambridge, MA
2009-2011	Research Associate, Immuno-histochemistry	R&D Systems, Minneapolis, MN

PROFESSIONAL ACTIVITIES

[1] F1000 Prime recommended, cover article and commentary in same issue

2017-	Peer reviewer for: *Nature Ecology and Evolution*, *Proceedings of the National Academy of Sciences, Chemical Communications, BMC Bioinformatics & Microorganisms*
2020-	Thesis committee member for Boston University Bioinformatics Program
2021-	Admissions committee member for Boston University Bioinformatics Program
2017-2018	Mentor/advisor for REU Summer Student, and three first year PhD students
2017-2018	Organiser for Kavli, Boston University Microbiome coffee hour
2017-2018	Organiser for BU, MIT & Harvard Physics of Living Systems Hangout

HONORS AND AWARDS

2020	Physics of Living Systems Fellowship	MIT
2018	Charles DeLisi Doctoral Dissertation Award	Boston University
2017	Hariri Data Science Graduate Student Fellowship	Boston University
2013	Dean's Fellowship	Boston University
2009	Biochemistry Summer Research Program	University of Minnesota
2008	Undergraduate Research Opportunity Program	University of Minnesota
2006-2008	Dean's List	University of Minnesota
2005-2009	Bentson Family Scholar	University of Minnesota